

Caring for Hardscapes in Cold Climates

The Effects Deicing Salt Can Have On Pavers

Every year in the northern United States, homeowners, business owners and public employees spread deicing salts on roads and walkways to melt snow and ice. While these salts can effectively eliminate slippery conditions, they also may adversely affect landscaping and hardscaping pavers by causing visual and structural damage. However, properly manufactured pavers can resist the degradation caused by the salts.

WITHSTANDING COLD CLIMATE CONDITIONS

Interlocking concrete pavers typically perform better in colder climates than rigid asphalt and solid concrete surfaces. “The high compression, low absorption rates of pavers make them more resistant to deicing agents,” says Len Browning, technical advisor for Belgard Hardscapes by Oldcastle.

Resistance to salts is related directly to a low absorption rate and a high compressive strength, and pavers generally outperform solid concrete and asphalt in both areas.

“The quality of aggregate materials used to manufacture pavers is an important component in the performance of pavers and their resistance to deicing salts,” says Browning. “Belgard sources aggregate materials that are high strength with low absorption rates, and no deleterious material that may contaminate the finished product.”

This produces a high-quality, salt-resistant surface that withstands extreme weather better than other surfaces.

Additionally, pavers withstand expansive soils and freeze-thaw movement better than rigid asphalt and solid concrete, which often crack under this type of shifting. Water can enter these cracks, and subsequent freeze-thaw cycles that cause the trapped water to freeze and expand can cause additional damage to paved surfaces. By contrast, pavers shift with the movement of the ground, avoiding cracking and consequential damage. Properly constructed pavers create a flexible, load-bearing surface that can accommodate ground movements without sustaining damage.

According to the Herndon, Va.-based Interlocking Concrete Pavement Institute (ICPI) Technical Committee, concrete pavers have these advantages over ready-mixed concrete:

- Stronger aggregate bonding from higher cement content than typically used in pavement quality concrete



- Smaller aggregates for more surface area for the cement to bond
- Lower water-to-cement ratio, and vibration and compaction during the manufacturing process to increase aggregate-cement contact and eliminate overwatering
- Produced in a highly controlled manufacturing plant, leading to lower variation in material properties and eliminating surface over-finishing
- Can be successfully installed in cold weather, since they are cured before leaving the manufacturing plant.

UNDERSTANDING THE INDUSTRY STANDARD

Lou Mangiaracina, VP of sales in the Northeast for Belgard, has witnessed the effects that excessive use of deicing salts can have on pavers. “I’ve seen salt damage pavers in as little as three years,” says Mangiaracina. “After a while, salt buildup can disintegrate pavers, if they are not properly manufactured and maintained.”

Contrary to some consumer misperceptions of industry advertising claims, no paver is truly deicing salt *proof*, although most are deicing salt *resistant*. Fortunately, ways to extend the lifespan and appearance of pavers, even where salts are used, do exist.

The American Society for Testing Materials (ASTM) C936/C936M - 09 defines the industry manufacturing standard for solid concrete interlocking pavers. This Standard Specification requires, in part:

- An average absorption no greater than 5 percent
- An average compressive strength of 8,000 pounds psi
- No greater mass loss than 200 g/m² when subject to 25 freeze-thaw cycles
- No greater mass loss than 500 g/m² when subject to 50 freeze-thaw cycles.

In areas where pavers are exposed to freezing and deicing materials during their service, ASTM C936/C936M - 09 requires testing the pavers in 3 percent saline solution to replicate the effects of deicing salts. When companies meet ASTM requirements, their pavers are considered resistant to deicing salts. Pavers from Belgard, for example, exceed this standard and are deicing salt resistant, but that does not make them deicing salt proof. In fact, no company's pavers are deicing salt proof.

One challenge the paver industry faces is potentially confusing advertising that can cause contractors, hardscapers and homeowners to believe that some branded pavers are guaranteed to be unaffected by deicing salts. Product statements such as "deicing salt resistant," while technically true, also can be misunderstood.

"Customers sometimes take 'deicing salt resistant' to mean 'deicing salt proof,'" says Daniel Moreland, a Belgard architectural representative for Anchor Concrete Products in Easton, Pa. "But there is a big difference between deicing salt resistant and proof."

Another claim sometimes misread by hardscape professionals and homeowners is a warranty that covers against the abnormal deterioration of a surface due to sodium chloride (NaCl), such as deicing salt. Such warranties cover only abnormal deterioration, which is damage that would exceed the allowances made in ASTM C936/C936M - 09.

To eliminate confusion, manufacturers should explain carefully their guarantees to customers. For example, if pavers do sustain deicing damage, warranties typically don't cover items such as labor costs to replace them, shipping costs for the

replacement pavers, and color matching. Professionals and homeowners who believe their pavers are protected against any and all damage caused from deicing salts could be unpleasantly surprised.

SAFEGUARD AGAINST DAMAGE

One of the best ways to protect pavers is to minimize their exposure to deicing salts. Although people tend to believe that more salt equates



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to better melting abilities or less frequent applications, excessive salting can harm the pavers. If salt ends up in piles or clumps, then it has been applied too heavily.

According to the ICPI, “The key to successfully using deicing materials is to use only as much [salt] as is needed to do the job. This will maximize paver benefits, while minimizing any damage to the concrete pavers and surrounding environment.”

Questions Contractors Should Ask

Before buying pavers, landscaping and hardscaping contractors should ask these questions to manufacturers:

- Are your pavers documented to meet the ASTM C936 / C936M – 09 standard?
- What exactly does your warranty cover?
- What isn’t covered by your warranty?
- What information do I need to pass along to my customers about your pavers?

Questions Homeowners Should Ask

The end consumers should be aware of the type of pavers they’re buying, how the pavers are affected by deicing salts and natural elements, and maintenance requirements. Homeowners and business owners should ask their contractors:

- What types of deicing salts are recommended to use on the pavers?
- What maintenance needs to be performed on the pavers, and how often?
- How do I maintain the look and appearance of my pavers?

The ICPI Technical Committee recommends these guidelines to limit the exposure to deicing:

- Mix the salt with sand, which is visible and the traction can be felt underfoot
- Follow the recommended application and don’t over-apply the salt
- Use deicing salt for melting ice, not for snow removal
- Remove the ice once it’s loose to avoid salt buildup
- Wash off the pavers in the spring, since the salt can continue to cause degradation even after the ice or snow has melted.

Routine maintenance can minimize the effects of deicing salts. As Moreland points out, “The bottom line is that every exterior surface needs some maintenance. Whether you live in the North and use deicing salts, the extremities of acid rain, pollution and vehicular traffic cause wear and tear on exterior surfaces.”


To maximize the life-cycle benefits of an interlocking concrete paver system, Moreland recommends using sealers. In addition to creating certain preferred looks, sealers may provide some protection against deicing salts, acid rain and lawn chemicals.

“Quality pavers are designed and manufactured to look attractive and perform for years and even decades, but professionals and homeowners can help extend the life of their hardscapes by cleaning and then sealing them regularly,” Moreland says.

With proper salting applications and routine maintenance, pavers will look attractive, resist degradation and provide a durable surface for decades. **IMAS**

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